



TITLE:

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CITATION:

Tanaka, Otohiko. SOME CALANOID COPEPODS COLLECTED CHIEFLY BY THE U.S. STEAMER ALBATROSS FROM THE PACIFIC OCEAN. PUBLICATIONS OF THE SETO MARINE BIOLOGICAL LABORATORY 1969, 17(4): 253-278

ISSUE DATE:

1969-12-27

URL:

<http://hdl.handle.net/2433/175601>

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SOME CALANOID COPEPODS COLLECTED CHIEFLY BY THE U. S. STEAMER *ALBATROSS* FROM THE PACIFIC OCEAN

OTOHIKO TANAKA¹⁾

With 12 Text-figures

In my previous paper "On *Euchirella* (Copepoda, Calanoida) collected chiefly by the U.S. Steamer *Albatross* from the Pacific Ocean" (TANAKA and OMORI 1968), I noted that among the species reported as *Euchirella* in C.B. WILSON's two papers, i.e. the Carnegie report (1942) and the Albatross report (1950), several species other than *Euchirella* are included. During the re-examination of specimens from the WILSON Collections, deposited in the United States National Museum (USNM), the following 17 species of calanoid copepods other than *Euchirella* were found from 46 vials labelled as *Euchirella*. Among them 3 are thought to be new species, and some are rather rare ones.

Calanidae

1. *Neocalanus robustior* (GIESBRECHT)
2. *Undinula vulgaris* (DANA)

Aetideidae

3. *Gaidius* species
4. ? *Gaetanus armiger* GIESBRECHT
5. * *Gaetanus minispinus*, new species
6. *Chirundina streetsi* GIESBRECHT
7. * *Chirundina indica* SEWELL
8. * *Chirundinella magna* (WOLFENDEN)
9. * *Undeuchaeta magna* TANAKA
10. *Undeuchaeta plumosa* (LUBBOCK)
11. *Wilsonidius alaskaensis*, new genus and species

Euchaetidae

12. *Euchaeta* species

Scolecithricidae

13. * *Scottocalanus infrequens*, new species
14. * *Scottocalanus rotundatus* TANAKA
15. *Scottocalanus securifrons* (T. SCOTT)

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16. *Lophothrix frontalis* GIESBRECHT17. *Scaphocalanus magnus* (T. SCOTT)

Undinula vulgaris, *Undeuchaeta plumosa*, *Euchaeta* species, and *Scottocalanus securifrons* were found in the collection from the Atlantic, but others were all sampled by the *Albatross* from the Pacific. The species indicated by an asterisk are, however, not listed in the *Albatross* report.

This paper deals with the taxonomy of these copepods. Besides descriptions of the new species, systematic or distributional remarks are presented for each species. *Euchaeta* species was not examined thoroughly because of its immaturity. All specimens have returned to the U.S. National Museum.

I would like to express my sincere appreciation to Dr. Thomas E. BOWMAN of the U.S. National Museum for making this material available for me.

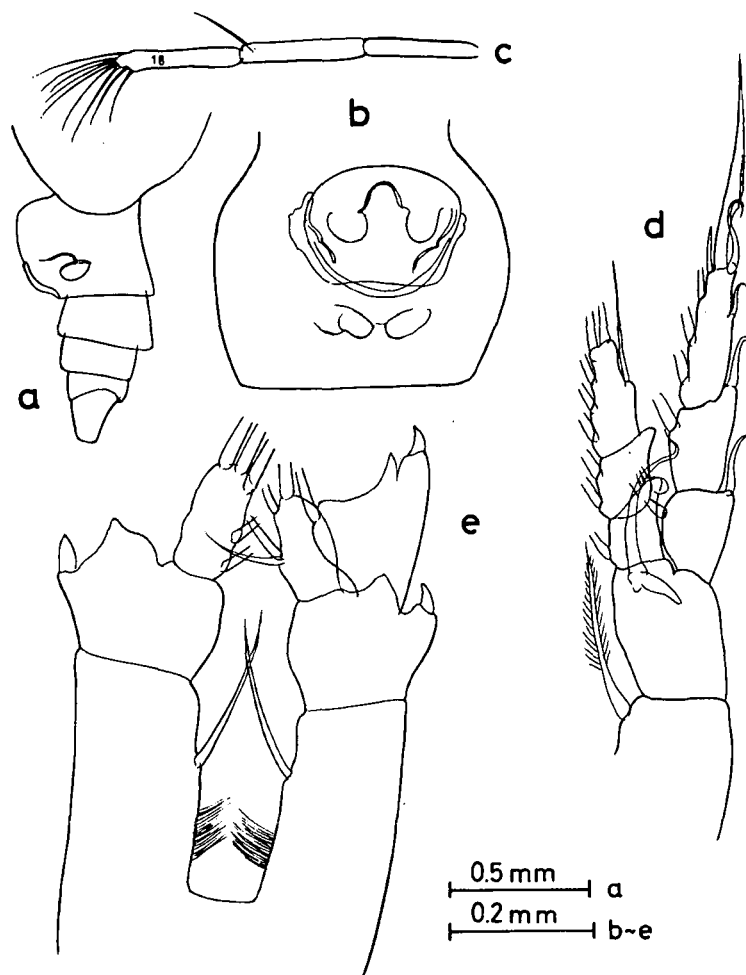


Fig. 1. *Neocalanus robustior* (GIESBRECHT), female: a, abdomen lateral view; b, genital segment, ventral view; c, 1st antenna; d, 1st leg; e, 4th leg.

Neocalanus robustior (GIESBRECHT 1888)

(Fig. 1, a-e)

Calanus robustior, GIESBRECHT, 1892, p. 91, pl. 7, figs. 15, 19, 25, 30, pl. 8, 34.*Neocalanus robustior*, VERVOORT, 1946, p. 44; VERVOORT, 1963, p. 83**Occurrence:** USNM No. 122533, Albatross Sta. 4680, 1 ad. ♀.

Remarks: Female, 4.65 mm. The genital segment is swollen; there is a ridge-like structure behind the genital opening. The 1st and 2nd legs are very characteristic in structure. In the present specimen the 1st antenna is abnormal in that the 18th segment is regenerated, carrying 9 setae at the distal margin. The 4th leg also has an abnormal endopod, 1-jointed instead of 3-jointed.

The occurrence of the species is well known in warm waters of the Atlantic and Indo-Pacific. The distribution and size variation are shown in the following table:

Author	Locality	Depth	Length mm	
			♀	♂
GIESBRECHT, 1892	Atlantic and Pacific	—	3.65-4.0	—
ESTERLY, 1905	San Diego region	—	3.17	—
FARRAN, 1929	Atlantic	Surface	4.05-4.32	—
MORI, 1937	East China Sea	0-30 m	3.14-4.00	—
VERVOORT, 1946	Malay Archipelago	0-30 m	3.55-3.80	—
SEWELL, 1947	Arabian Sea	0-500 m	3.67-3.93	—
TANAKA, 1956	Sagami Bay	Surface	—	3.00
GRICE, 1962	Equatorial Pacific	62-126 m	3.40-4.08	—
VERVOORT, 1963	Gulf of Guinea	0-10 m	3.42-3.90	2.84
Present record	Off Peru	Surface	4.65	—

Undinula vulgaris (DANA, 1849)*Calanus vulgaris*, GIESBRECHT, 1892, p. 92, pl. 6, fig. 11, pl. 7, figs. 2, 24, 27, 28, pl. 8, figs. 13, 17, 35.*Undinula vulgaris*, SEWELL, 1929, p. 31, figs. 5-10; VERVOORT, 1946, p. 72, fig. 6; VERVOORT, 1963, p. 83.**Occurrence:** USNM No. 122539, Carnegie Sta. 1, 1 ad. ♀.

Remarks: Female, 2.83 mm. This species is a surface inhabitant, and is found mainly in coastal waters. Its synonymy and distribution have been discussed by VERVOORT (1946). Some records of the distribution and size variation are given in the following table:

Author	Locality	Depth	Length mm	
			♀	♂
SEWELL, 1929	Bay of Bengal	—	1.87-2.62	—
WILSON, 1932	Woods Hole region	Surface	2.40-2.85	2.00-2.25
FARRAN, 1936	Barrier Reef	0-30 m	2.40-3.05	2.25-2.50
MORI, 1937	East China Sea	0-20 m	—	—

VERVOORT, 1946	Malay Archipelago	Surface	2.25-3.25	2.08-2.50
TANAKA, 1956	Sagami Bay	Surface	2.75-2.81	2.31-2.69
VERVOORT, 1963	Gulf of Guinea	Surface	2.10-2.80	2.13-2.48
Present record	East of Maryland	Surface	2.83	

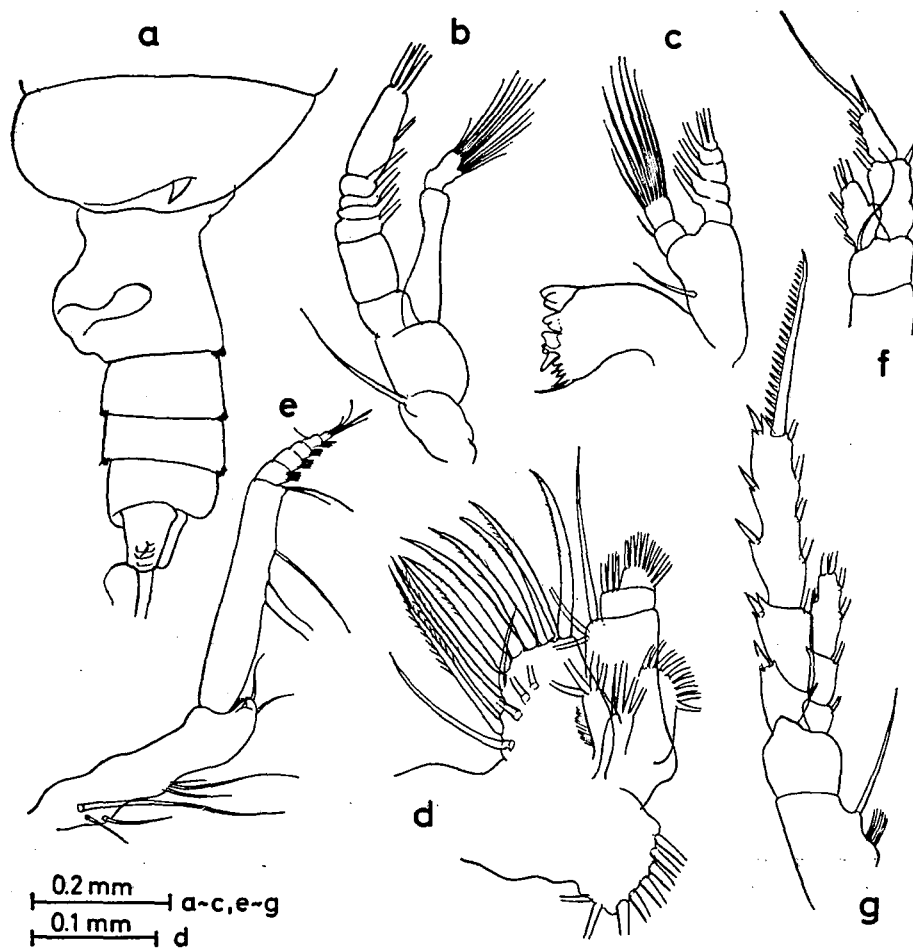


Fig. 2. *Gaidius* species, female: a, last thoracic segment and abdomen, lateral view; b, 2nd antenna; c, mandible; d, 1st maxilla; e, maxilliped; f, 1st leg; g, 4th leg.

Gaidius species

(Fig. 2, a-g)

Occurrence: USNM No. 70318, Albatross Sta. 4679, 1 ad. ♀.

Descriptive Notes: The specimen is very softened and mutilated in the cephalothorax. The abdomen is 4-jointed, measuring 0.52 mm in length. The abdominal segments and furca are in the following proportional lengths:

Segment	1-2	3	4	5	Furca
	37	19	14	12	18=100

The furcal ramus is longer than wide (9:6).

The 1st antenna is 24-jointed, measuring 2.8 mm in length. The segments are in the following proportional lengths:

Segment	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	101	54	29	25	29	25	29	39	22	25	22	39	39	39
	16	17	18	19	20	21	22	23	24	25				
	47	50	47	61	54	47	54	50	54	18=1000				

The 2nd antenna has a 7-jointed exopod, and is about 1.5 times as long as the endopod. The endopod is slender, having 6 setae on the outer and inner lobes respectively. In the mandible the palp is slender; the endopod has 8 setae on the distal margin; the cutting edge has the usual structure. The 1st maxilla has the following number of setae on the various lobes: 8 setae on the outer lobe; 10 setae on the exopod; 8+3 setae on the endopod; 3 setae on the 2nd basal segment; 4 setae on the 2nd and 3rd inner lobes respectively; 14 setae on the 1st inner lobe. In the 2nd maxilla the spine on the 4th inner lobe is very strong; the endopod has 6 setae. The maxilliped is slender; the 1st basal segment has no lamellous plate on the outer margin.

In the 1st leg the 1st and 2nd segments of the exopod are fused; there is no marginal spine on the 1st segment of the exopod. The 2nd leg has a 3-jointed exopod and a 1-jointed endopod; the terminal spine of the exopod has 19 teeth on the outer margin. The 3rd and 4th legs both have 3-jointed exopods and endopods; the terminal spine of the exopod has 17 teeth in the 3rd leg, and 23 teeth in the 4th leg respectively. The 1st basal segment of the 4th leg has 6 bristles on the inner margin.

Remarks: It is certain that the specimen is a member of the genus *Gaidius*. However, except *G. minutus* Sars, all species hitherto been described are larger than the present specimen. The specimen may be a new one, but it is better to leave it unnamed in view of the poor condition.

?*Gaetanus armiger* GIESBRECHT, 1888

(Fig. 3, a-e)

Gaetanus armiger GIESBRECHT, 1892, p. 219, pl. 14, figs. 19, 20, 22, 23, 26, 28, 29, pl. 36, figs. 2, 4, 5; A. SCOTT, 1909, p. 45, pl. 8, figs. 16-22; MORI, 1937, p. 40, pl. 17, figs. 8-13; TANAKA, 1957, p. 172, figs. 42, a-d.

Occurrence: USNM No. 122749, Albatross Sta. 4679, 1 ad. ♂.

Descriptive Notes: Male, 2.55 mm. The specimen is slightly deformed in the

abdomen. The general appearance resembles that of *G. kruppi* GIESBRECHT. The cephalothorax and abdomen are in the proportional lengths of 75 to 25. The last thoracic segment is provided with a small rounded process on the ventral distal margin.

The abdominal segments and furca are in the following proportional lengths:

Segment	1	2	3	4	5	Furca
	28	25	17	17	3	10=100

The 2nd to 4th segments are fringed with spinules on the ventral distal margin.

The 1st antenna is 20-jointed, extending to the distal margin of the genital segment. The segments are in the following proportional lengths:

Segment	1	2	3	4	5	6	7	8-9-10	11	12-13	14	15
Right	73	46	28	18	23	18	28	64	11	50	33	37
Left	75	49	31	22	22	22	27	67	32	44	35	31
16	17	18	19	20-21	22	23	24-25					
41	41	50	60	110	87	83	87=1000					
40	44	48	62	106	89	84	80=1000					

The 2nd antenna has the exopod 1.4 times as long as the endopod. The endopod has 6 setae on the outer and inner lobes respectively. The 1st maxilla has 7 setae on the outer lobe; 10 setae on the exopod; 7+3 setae on the endopod including the 2nd basal segment; the 1st to 3rd inner lobes are much reduced. The maxilliped is slender; there is no lamellous process on the outer margin of the 1st basal segment.

The 1st leg has a 3-jointed exopod and a 1-jointed endopod. The outer marginal spine of the 1st segment of the exopod is very small; the outer marginal spine of the 2nd segment is replaced by a small blunt process accompanied by 2 small spines. The 2nd leg has a 3-jointed exopod and a 2-jointed endopod. The 3rd and 4th legs both have 3-jointed exopods and endopods.

In the 5th pair of legs the 3rd segment of the exopod of the left leg is furnished with spinules on the inner margin near the proximal margin; the 2nd segment has a process furnished with spinules on the distal margin; the endopod of the left leg is small. The right leg has a 3-jointed exopod and a 1-jointed endopod.

Remarks: The specimen comes near to *G. kruppi* or *G. armiger* in the structure of the forehead, the exopod of the 1st leg, and the 1st segment of the maxilliped. It is also closely allied to *G. simplex* BRODSKY, but in *G. simplex* the 1st leg has a 2-jointed exopod. The endopod of the left 5th leg is much longer proportionally than that of the present specimen. The distribution and size variation of *G. armiger* are as follows:

Author	Locality	Depth	Length mm	
			♀	♂
A. SCOTT, 1909	Malay Archipelago	0- 900 m	3.5	—
SARS, 1925	North Atlantic	0-2000 m	3.0	—

TANAKA, 1957	Sagami Bay	0-1000 m	3.37	—
VERVOORT, 1963	Gulf of Guinea	0- 600 m	2.95-3.05	—
Present record	Peru to Easter Is.	0- 300 fms	—	2.55

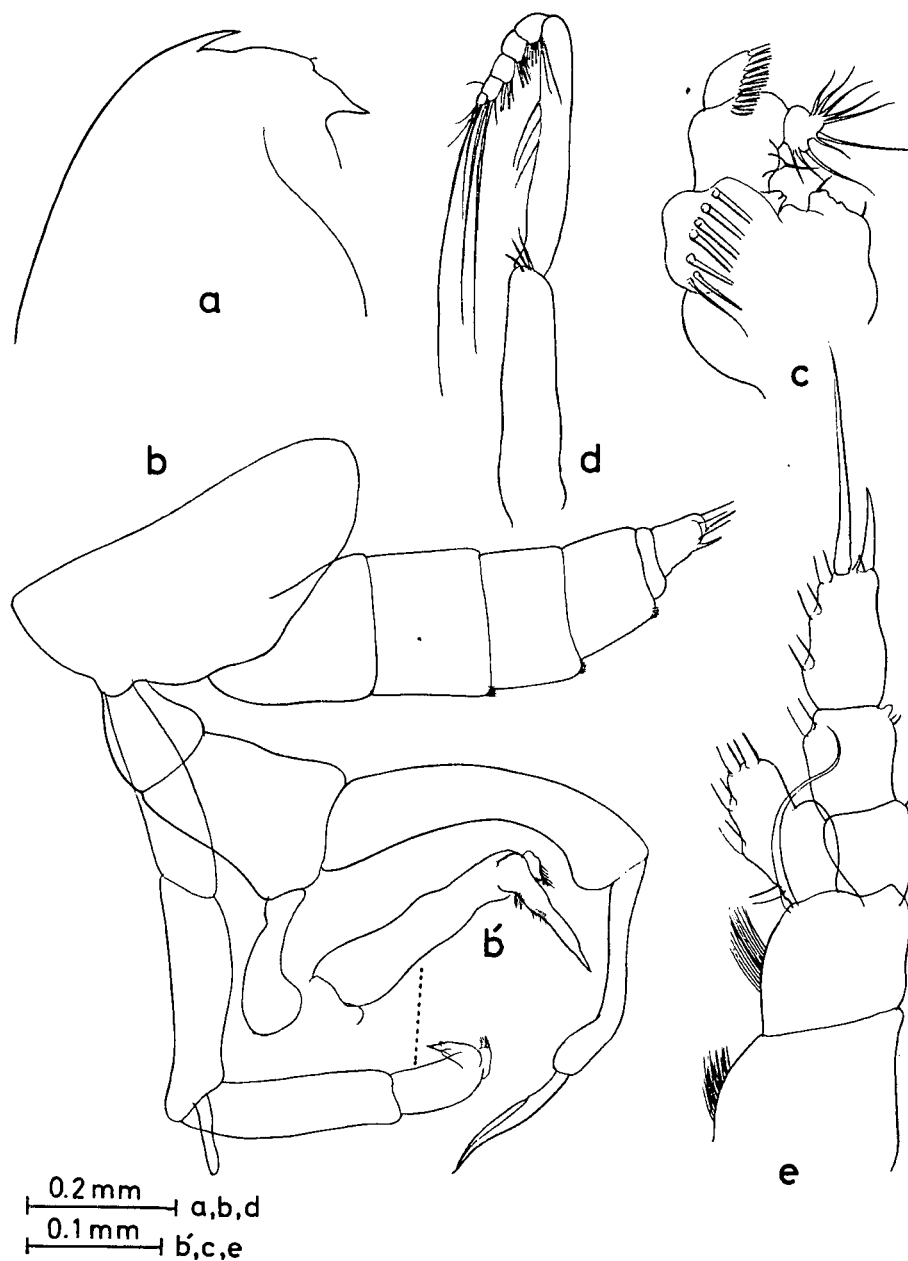


Fig. 3. *Gaetanus armiger* GIESBRECHT, male: a, head, lateral view; b, last thoracic segment, abdomen and 5th pair of legs; c, 1st maxilla; d, maxilliped; e, 1st leg.

Gaetanus minispinus, new species

(Fig. 4, a-h)

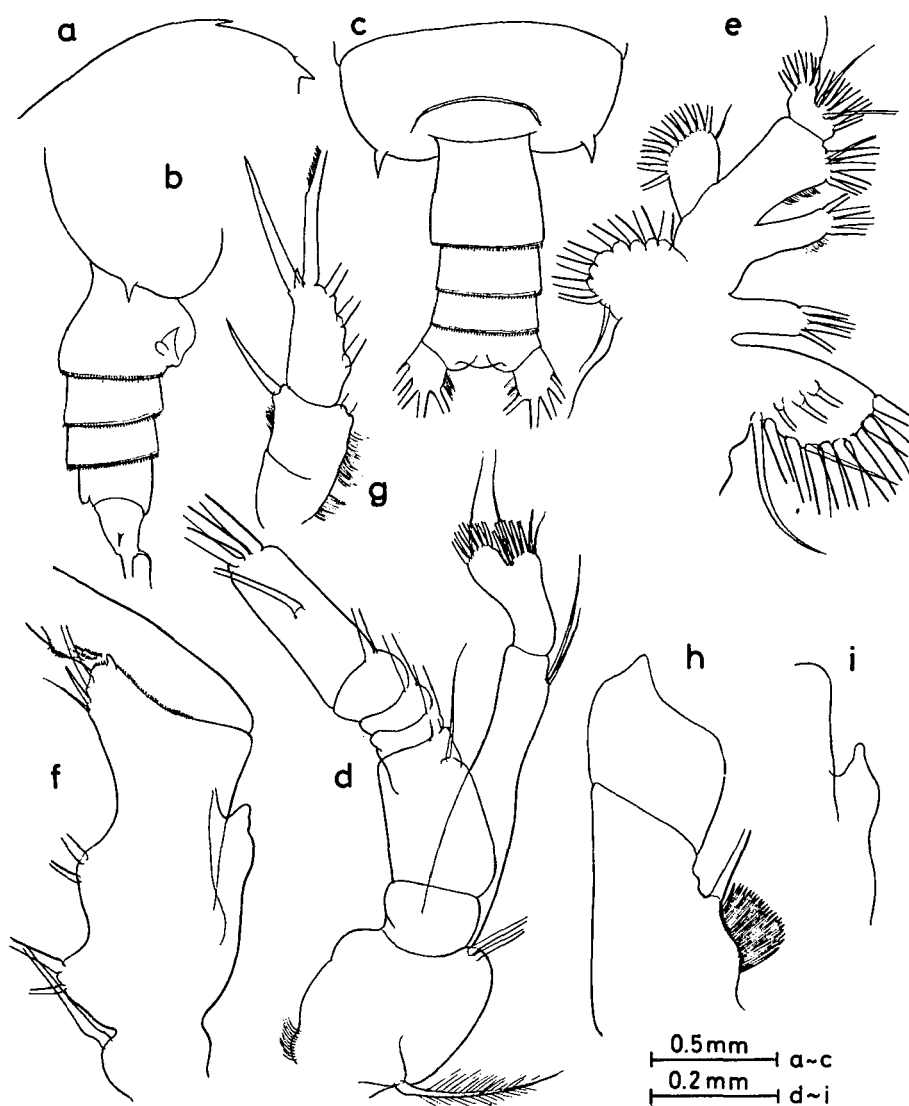
Occurrence: USNM No. 122750, Albatross Sta. 5320, 1 ad. ♀.*Descriptive Notes:* Female, 5.50 mm (holotype, USNM No. 122750). The body is

Fig. 4. *Gaetanus minispinus*, new species, female: a, head, lateral view; b, last thoracic segment and abdomen, lateral view; c, last thoracic segment and abdomen, dorsal view; d, 2nd antenna; e, 1st maxilla; f, maxilliped; g, 1st leg, exopod; h, 4th leg. *Gaetanus kruppi* GIESBRECHT, female: i, maxilliped, lamellous process of 1st basal segment.

robust. The cephalothorax and abdomen are in the proportional lengths of 78 to 22. The head is fused with the 1st thoracic segment; the 4th and 5th thoracic segments are fused. The cephalic spine is very small. The last thoracic segment is furnished with a small lateral spine on the distal margin. The rostrum is directed ventrally.

The abdominal segments and furca are in the following proportional lengths:

Segment	1-2	3	4	5	Furca
	38	17	16	10	19=100

The genital segment is symmetrical, swollen below; the distal margin of the segment is striated with spinules. The 3rd and 4th segments are striated with spinules on the distal margin. The furcal ramus is as long as wide.

The 1st antenna extends beyond the end of the furca by the distal 2 segments; it measures 6.3 mm in length; the segments are in the following proportional lengths:

Segment	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	59	49	27	25	25	29	33	53	24	27	27	51	29	49
	16	17	18	19	20	21	22	23	24	25				
	49	53	48	60	55	40	59	51	38	19=1000				

In the 2nd antenna the exopod is about as long as the endopod; the endopod has 8 setae on the inner lobe, and 7 setae on the outer lobe. The mandible has 9 setae on the distal margin of the endopod; the cutting edge is furnished with 8 teeth and an inner marginal seta. The 1st maxilla has the following number of setae on the various lobes: 9 setae on the outer lobe; 11 setae on the exopod; 4+4+6 setae on the endopod; 5 setae on the 2nd basal segment; 4 setae on the 3rd inner lobe; 4 setae on the 2nd inner lobe; 14 setae on the 1st inner lobe. The 2nd maxilla is robust; the proximal outer margin of the 1st basal segment is swollen; the endopod has 6 setae; the 5th inner lobe is furnished with 2 spines on the anterior distal margin. In the maxilliped the 1st basal segment is furnished with a lamellous process on the outer margin which differs in shape from that of *G. kruppi* (Fig. 4, i).

The 1st leg has a 2-jointed exopod and a 1-jointed endopod; the 1st and 2nd segments of the exopod are incompletely fused; the outer marginal spine of the 2nd segment is long, reaching the distal margin of the 3rd segment of the exopod. The 2nd leg has a 3-jointed exopod and a 2-jointed endopod; the terminal spine of the exopod has 21 teeth. The 3rd and 4th legs have 3-jointed exopods and endopods. In the 4th leg the 1st basal segment is furnished with about 23 bristles on the inner margin.

Remarks: The present species is closely allied to *G. kruppi* GIESBRECHT and also to *G. simplex* BRODSKY. However, it is distinguished from them by the small cephalic spine, small lateral spines on the last thoracic segment, and the shape of the lamellous process on the 1st basal segment of the maxilliped. The outer marginal spine of the

2nd segment of the exopod of the 1st leg is also characteristic.

The present species occurs in the Izu region, too.

Author	Locality	Depth	Length mm	
			♀	♂
TANAKA & OMORI (unpublished)	Izu region	0-680 m	5.15-5.56	—
Present record	China Sea	0-500 fms	5.50	—

Chirundina streetsi GIESBRECHT, 1895

Chirundina streetsi, ESTERLY, 1906, p. 59, pl. 9, fig. 2, pl. 10, fig. 28, pl. 12, fig. 58, pl. 14, figs. 86, 87; A. SCOTT, 1909, p. 43, pl. 12, figs. 1-11; SARS, 1925, p. 77, pl. 22 figs. 8-13; TANAKA, 1957, p. 190, fig. 53; GRICE, 1962, p. 196, figs. 1-4.

Occurrence: USNM No. 122505, Albatross Sta. 5320, 1 ad. ♀; USNM No. 122506, Bache Sta. 10210, 3 ad. ♂ and 1 ad. ♂.

Remarks: Female, 4.45-5.30 mm; male 4.50 mm. This is very widely distributed over deep waters of the Atlantic, Indian, and Pacific Oceans.

Author	Locality	Depth	Length mm	
			♀	♂
A. SCOTT, 1909	Malay Archipelago	0-2000 m	4.80-5.30	3.80
WITH, 1915	North Atlantic	0- 600 m	5.22	3.80
SARS, 1925	Atlantic	0-1500 m	5.10	4.20
FARRAN, 1929	Off New Zealand	Surface	4.15	—
SEWELL, 1947	Arabian Sea	0-1500 m	5.35	—
BRODSKY, 1950	Far eastern seas of the USSR	—	5.0 -5.1	4.3 -4.5
TANAKA, 1957	Izu region	0-1000 m	5.01	4.81
GRICE, 1962	Equatorial Pacific	0- 280	4.94	—
VERVOORT, 1963	Gulf of Guinea	100- 600 m	4.65-5.55	4.05-4.80
Present record	China Sea and off Bahamas	0- 500 fms	4.45-5.30	4.50

Chirundina indica SEWELL, 1929

(Fig. 5, a-e)

Chirundina indica SEWELL, 1929, p. 119, figs. 45, 46; SEWELL, 1947, p. 92, fig. 20; GRICE, 1962, p. 196, pl. 11, figs. 5-20.

Occurrence: USNM No. 122504, Albatross Sta. 5231, 1 ad. ♂.

Descriptive Notes: Male, 3.75 mm. The present specimen agrees fairly well with the description of *C. indica* given by SEWELL (1947). The 1st antenna extends to the distal margin of the furca. The 2nd antenna has the exopod about 1.5 times as long as the endopod; the endopod has 6 setae on the outer lobe, and 7 setae on the inner lobe. The mandible is of the usual structure, and has 9 setae on the endopod, and 6

setae on the exopod. In the 1st maxilla the outer lobe has 5 setae; the exopod has 11 setae; the endopod has 8 setae; the 2nd basal segment has 3 setae; the 3rd inner lobe has 1 seta; the 1st and 2nd inner lobes are much reduced.

The 1st leg has a 3-jointed exopod and a 1-jointed endopod; there is no marginal

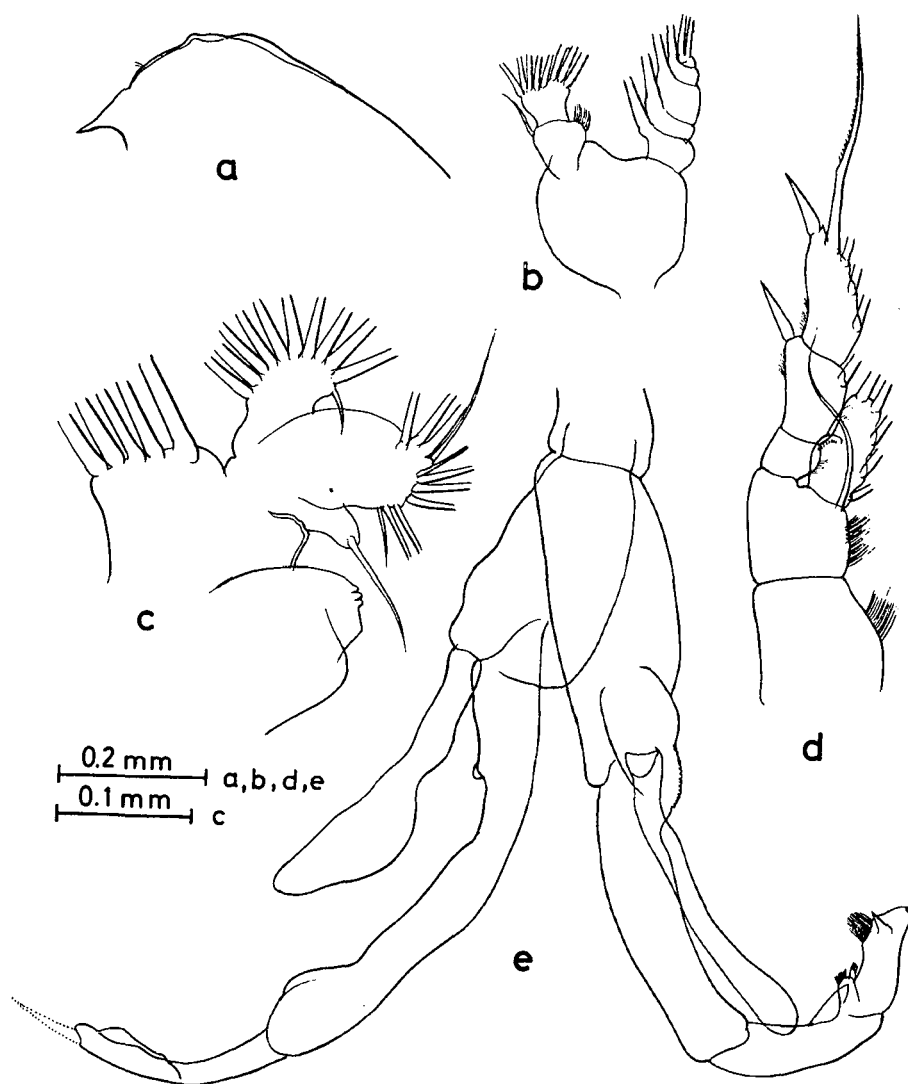


Fig. 5. *Chirundina indica* SEWELL, male: a, head, lateral view; b, mandible; c, 1st maxilla; d, 1st leg; e, 5th pair of legs.

spine on the 1st segment of the exopod. The 5th pair of legs agrees well with that figured by SEWELL.

Remarks: According to SEWELL (1947), the 2nd antenna of the male has 8 setae on

the inner and outer lobes respectively. In the present specimen, however, the inner lobe has 7 setae, and the outer lobe has 6 setae. An inner marginal seta might have been lost in the present specimen. The 1st maxilla has 11 setae on the exopod and 11 setae on the endopod including the 2nd basal segment in the present specimen, whereas, it has 10 and 10 setae respectively in SEWELL's one.

Author	Locality	Depth	Length mm	
			♀	♂
SEWELL, 1929	Arabian Sea	0- 200 fms	4.19-4.75	—
SEWELL, 1947	Arabian Sea	0- 300 m	4.05-5.00	3.97
GRICE, 1962	Equatorial Pacific	0- 169 m	4.66	—
Present record	Off Philippines	0- 80 fms	—	3.75

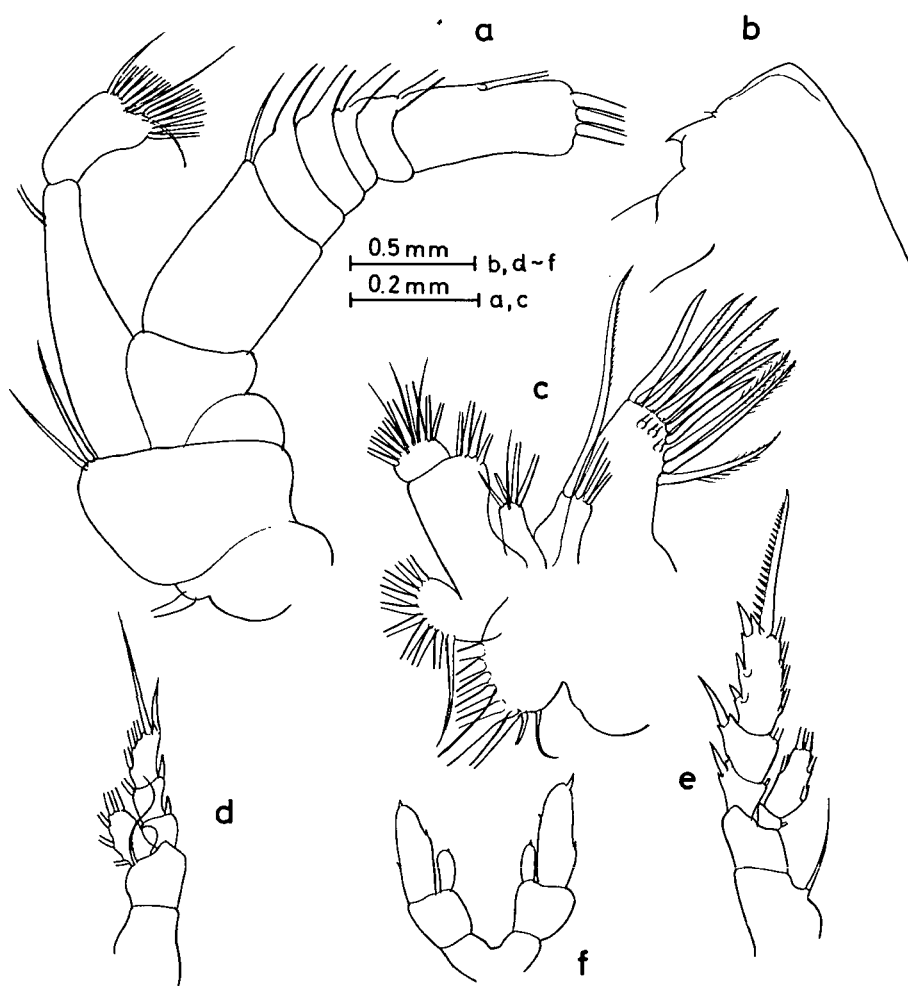


Fig. 6. *Chirundinella magna* (WOLFENDEN), female: a, 2nd antenna. Immature male: b, head, lateral view; c, 1st maxilla; d, 1st leg; e, 2nd leg; f, 5th pair of legs.

Chirundinella magna (WOLFENDEN, 1911)

(Fig. 6, a-f)

Chirundina magna WOLFENDEN, 1911, p. 241, text-fig. 27, a, b, pl. 28, figs. 10-13.*Chirundinella cara* TANAKA, 1957, p. 197, fig. 57; GRICE & HULSEMANN, 1967, p. 23, fig. 55.

Occurrence: USNM No. 122503, Albatross Sta. 4652, 1 ad. ♀; USNM No. 70314, Albatross Sta. 4680, 1 juv. ♂.

Remarks: The present genus is very closely allied to *Chirundina* but is easily distinguished from the latter by having a long appendicular seta on the furcal rami, the structure of the 1st maxilla, and by the absence of the marginal spine on the 1st segment of the 1st leg. *C. magna* WOLFENDEN (1911) may be a synonym of the present species. His specimens measured 6.0-6.6 mm in length.

The immature male measured 6.9 mm in length and has a 4-jointed abdomen. The 2nd antenna has 5 setae on the outer lobe and 7 setae on the inner lobe. In the 1st maxilla the outer lobe has 9 setae, of which the proximal 4 are very strong; the endopod has 11 setae; the 2nd basal segment has 4 setae; the 3rd inner lobe has 5 setae; the 2nd inner lobe has 4 setae; the 1st inner lobe has 13 setae. The 5th pair of legs is undeveloped; the exopod and endopod are 1-jointed.

Author	Locality	Depth	Length mm	
			♀	♂
TANAKA, 1957	Sagami Bay	0-1000 m	7.44	—
GRICE & HULSEMANN, 1962	Arbian Sea	275- 817 m	7.80	—
Present record	Off Peru	0- 400 fms	8.10	6.9 (V stage)

Undeuchaeta plumosa (LUBBOCK, 1856)*Undeuchaeta minor* GIESBRECHT, 1892, p. 228, pl. 14, figs. 31-34, pl. 37, figs. 55, 58.

Undeuchaeta plumosa, A. SCOTT, 1909, p. 62, pl. 22, figs. 1-6; SARS, 1925, p. 79, pl. 23, figs. 1-6; MORI, 1937, p. 41, pl. 17, figs. 6, 7; VERVOORT 1957, p. 70; TANAKA, 1957, p. 199, fig. 58; GRICE, 1962, p. 199, pl. 12, figs. 1-14.

Occurrence: USNM No. 122538, Bache Sta. 10210, 2 ad. ♀.

Remarks: This is a common sub-surface species in warm waters in the Atlantic, Indian, and Pacific Oceans. Some records of its distribution and size variation are summarized in the following table:

Author	Locality	Depth	Length mm	
			♀	♂
GIESBRECHT, 1892	Pacific	0-1500 m	3.2	—
A. SCOTT, 1909	Malay Archipelago	0- 700 m	3.5-4.5	3.2 -3.6
SARS, 1925	Atlantic	Surface	4.0	3.2
FARRAN, 1929	Atlantic and off New Zealand	Surface	3.5 -3.7	—

MORI, 1937	East China Sea	0- 100 m	3.2	3.1
BRODSKY, 1950	Far eastern seas of the USSR	—	3.2-4.2	3.2
TANAKA, 1957	Izu region	0-1000 m	3.61	3.45
GRICE, 1962	Equatorial Pacific	0- 150 m	3.41-3.47	3.52
VERVOORT, 1963	Gulf of Guinea	0- 10 m	3.30-3.75	2.85-3.35
Present record	Off Bahamas	—	3.60-3.80	

Undeuchaeta magna TANAKA, 1957

(Fig. 7, a-e)

Undeuchaeta magna TANAKA, 1957, p. 203, fig. 60; PAIVA, 1963, p. 39, fig. 17.

Occurrence: USNM No. 122537, 1 ad. ♀.

Remarks: The present species resembles *U. bispinosa* ESTERLY, but can be distinguished from the latter by its larger size and by the armature of the genital segment of the female. The 2nd antenna has the exopod 1.8 times as long as the endopod; the endopod has 7 setae on the outer lobe, and 8 setae on the inner lobe. The mandible is of the usual structure. In the 1st maxilla the outer lobe is furnished with 9 setae; the exopod with 11 setae; the endopod with 13 setae; the 2nd basal segment with 4 long and 2 small setae; the 3rd inner lobe with 4 setae; the 2nd inner lobe with 3 setae, and the 1st inner lobe with 14 setae. The 2nd maxilla is like that of *U. bispinosa* figured by SEWELL (1929). In the maxilliped the segments of the endopod are short and robust; the 1st basal segment is half as long as the 2nd one.

In the 1st leg the 1st and 2nd segments of the exopod are fused. In the present specimen the left leg is abnormal in structure; it is provided with an outer marginal spine on the area where the 1st and 2nd segments are fused. The right leg is normal, and is devoid of the spine on the same area. The 4th leg has bristles on the inner proximal margin of the 1st basal segment; the terminal spine of the exopod has about 40 teeth. The species has been reported from the Pacific and Atlantic.

Author	Locality	Depth	Length mm	
			♀	♂
TANAKA, 1957	Suruga Bay	0-1000 m	6.07	—
PAIVA, 1963	Off Cape Verde	—	6.29	—
Present record	Pacific	—	6.03	

Wilsonidius, new genus

Type Species: *Wilsonidius alaskaensis*

Definition: Cephalothorax elongate ovate. Head is fused with 1st thoracic segment; 4th and 5th thoracic segments are fused. Head has no median crest. Rostrum 1-pointed. Abdomen 4-segmented in the female. Furcal ramus is furnished with a small lateral spine, 4 long setae, and an appendicular seta. First antenna 24-jointed;

the 8th and 9th segments are fused; the 24th and 25th are separated. The 2nd antenna has a 7-jointed exopod which is longer than the endopod. The mandibular palp is furnished with marginal setae; exopod is longer than endopod; the cutting edge has the normal structure. The 1st maxilla has 9 setae on the outer lobe; endopod has 15 setae; 2nd basal segment has 5 setae. The 2nd maxilla as in *Undeuchaeta*. In

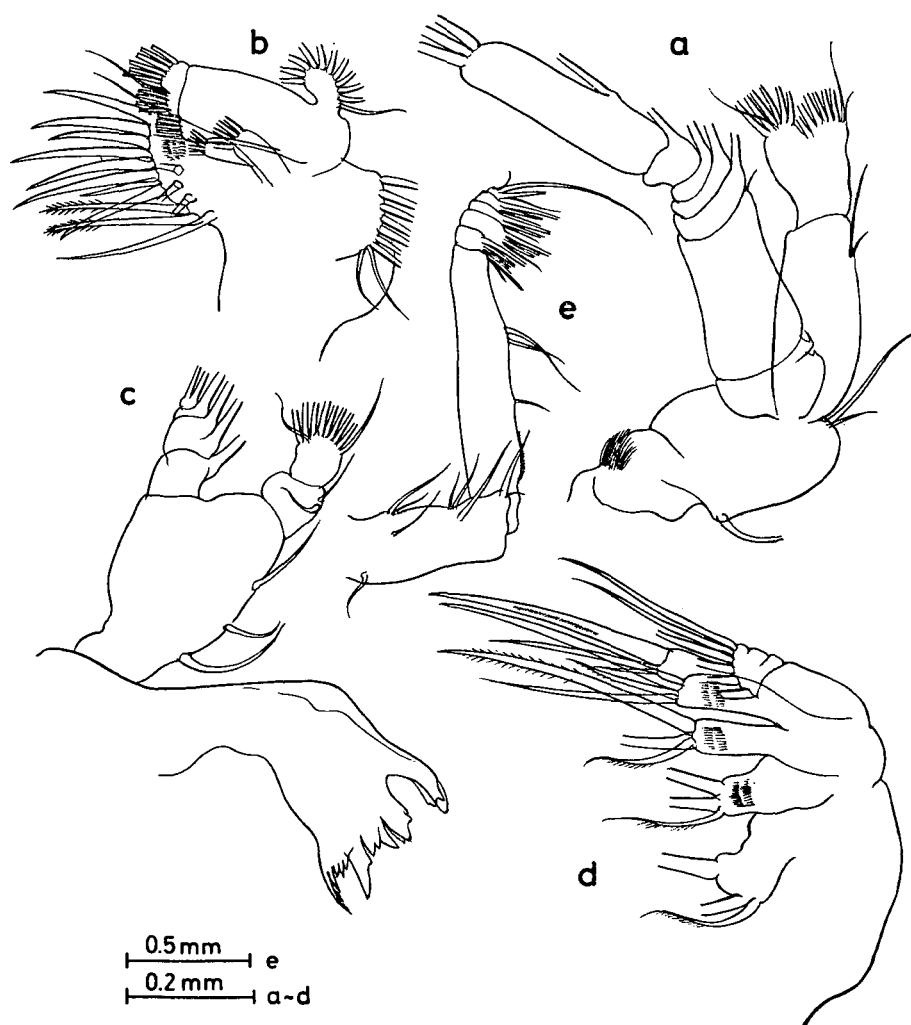


Fig. 7. *Undeuchaeta magna* TANAKA, female: a, 2nd antenna; b, 1st maxilla; c, mandible; d, 2nd maxilla; e, maxilliped.

the maxilliped the 2nd basal segment is much longer than the 1st one; the outer margin of the 2nd basal segment is striated with a lamellous plate. The 1st leg has a 3-jointed exopod and a 1-jointed endopod. The 2nd leg has a 3-jointed exopod and

a 1-jointed endopod. The 3rd and 4th legs have 3-jointed exopods and endopods. The 4th leg has no spine on the inner margin of the 1st basal segment. The 5th leg is absent in the female. Male is unknown.

Wilsonidius alaskaensis new species

(Fig. 8, a-f and 9, a-f)

Occurrence: USNM No. 67133, Albatross Sta. 4750, 1 ad. ♀.

Descriptive Notes: Female, 3.70 mm (holotype, USNM No. 67133). The body is elongate ovate, 3 times as long as wide. The cephalothorax and abdomen are in the proportional lengths of 74 to 26. The head is fused with the 1st thoracic segment; the 4th and 5th thoracic segments are fused. The frontal margin of the head is produced in dorsal view; however, it is broadly rounded in lateral view. The distal margin of the last thoracic segment is narrowly rounded but is irregular in outline at the apex. There is a demarcation between the 4th and 5th thoracic segments along the lateral margins, but no line of separation between these segments was observed. The rostrum is 1-pointed and long, directing downwards.

The abdominal segments and furca are in the following proportional lengths:

Segment	1-2	3	4	5	Furca
	45	19	13	5	18=100

The genital segment is symmetrical, and dilated posteriorly; it is swollen considerably below. The 3rd and 4th segments are fringed with fine spinules on the distal margin. The furcal ramus is as long as wide; it carries a small lateral spine, 4 long setae and an appendicular seta.

The 1st antenna is 24-jointed, extending to the end of the 3rd abdominal segment; it measures 4.3 mm in length. The segments are in the following proportional lengths:

Segment	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	69	51	25	30	30	28	30	46	25	30	30	39	41	51
	16	17	18	19	20	21	22	23	24	25				
	51	55	48	67	58	44	48	51	41	12=1000				

The 2nd antenna has a 7-jointed exopod which is about 1.5 times as long as the endopod; the 1st segment of the exopod is furnished with a small seta on the inner distal margin; the 2nd segment has 2 small setae on the inner proximal margin and a small one at the inner distal margin; the 3rd to 6th segments are furnished with a long seta respectively; the 7th segment has 3 terminal and an inner marginal setae. The distal segment of the endopod carries 8 setae on the inner lobe, and 7 setae on the outer lobe.

The mandibular palp is elongate; it is furnished with 3 inner marginal setae; the

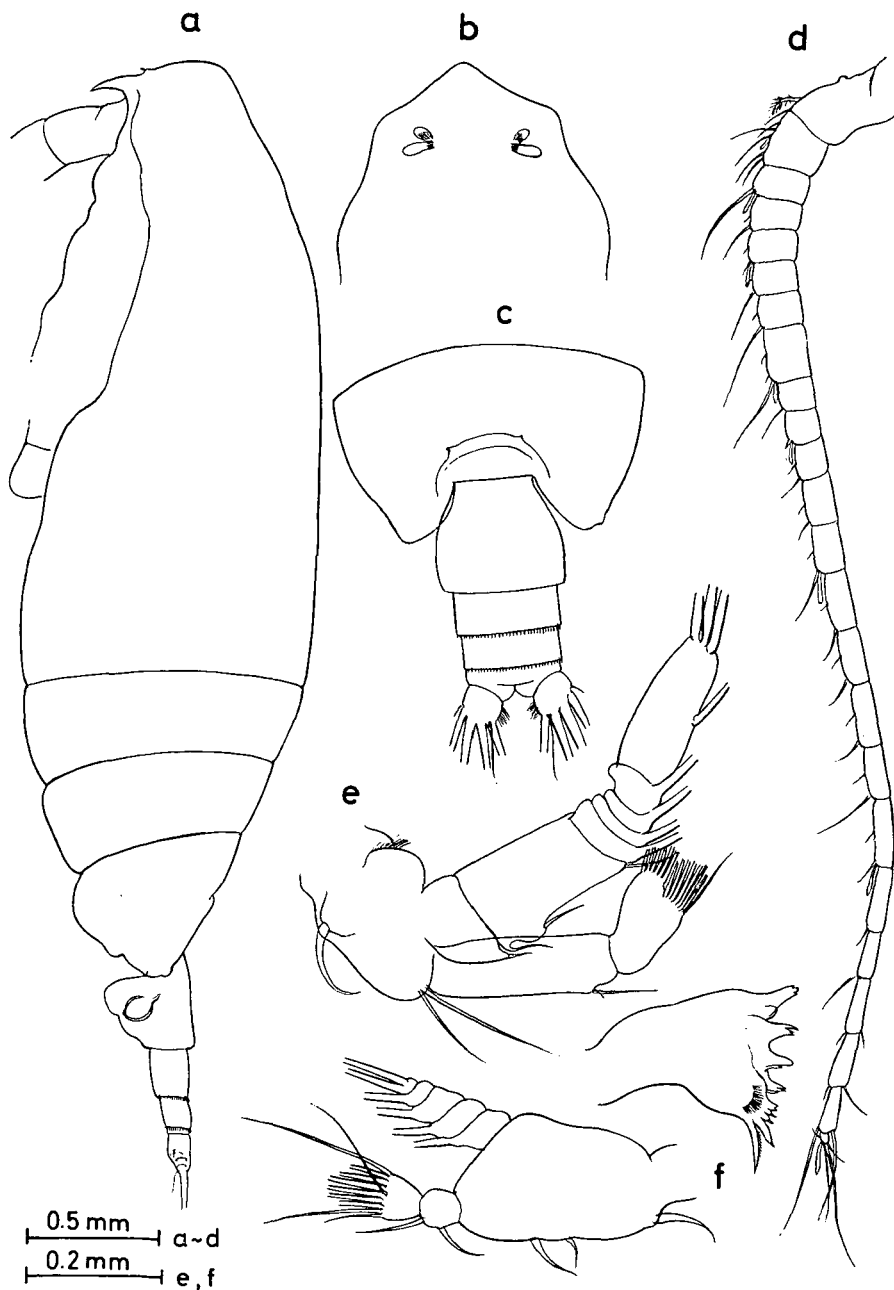


Fig. 8. *Wilsonidius alaskaensis*, new genus and new species, female: a, whole animal, lateral view; b, head, dorsal view; c, last thoracic segment and abdomen, dorsal view; d, 1st antenna; e, 2nd antenna; f, mandible.

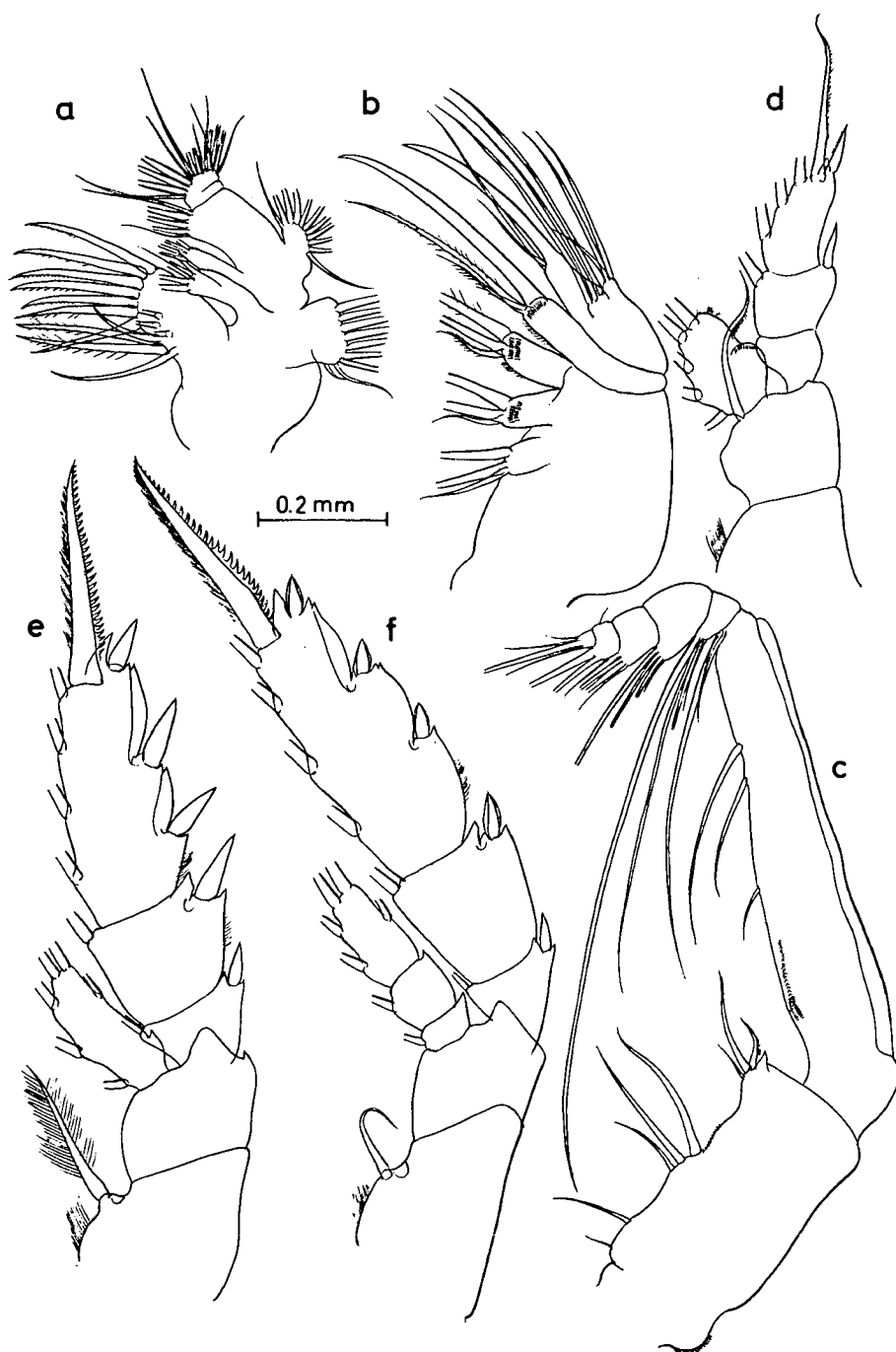


Fig. 9. *Wilsonidius alaskaensis*, new genus and new species, female: a, 1st maxilla; b, 2nd maxilla; c, maxilliped; d, 1st leg; e, 2nd leg; f, 4th leg.

exopod is 5-jointed, carrying 6 setae in all; the 1st segment of the endopod is furnished with 2 marginal setae; the distal segment with 10 setae. The cutting blade has 8 teeth and an inner marginal seta.

The 1st maxilla has 9 setae on the outer lobe; 11 setae on the exopod; 6+5+4 setae on the 3rd to 1st segments of the endopod; 5 setae on the 2nd basal segment; 4 setae on the 3rd inner lobe; 5 setae on the 2nd inner lobe; 14 setae on the 1st inner lobe.

The 2nd maxilla is like that of *Euchirella* or *Gaidius*. The 1st basal segment is swollen on the proximal outer margin; the 1st to 5th inner lobes are furnished with 3 setae respectively; the endopod has 6 setae.

In the maxilliped the 2nd basal segment is 2 times as long as the 1st one, and is striated with a lamellous plate along the outer margin; in the endopod the segments are short and are furnished with 4, 3, 3, 3+1 and 3+1 setae on the 1st to 5th segments.

The 1st leg has a 3-jointed exopod and a 1-jointed endopod; the 1st segment of the exopod is devoid of any marginal spine; the 2nd and 3rd segments have a marginal spine. The 2nd leg has a 3-jointed exopod and a 1-jointed endopod; the 3rd segment of the exopod has 3 marginal spines; the terminal spine has 37 teeth. The 3rd leg is composed of 3-jointed exopod and endopod. The 4th leg has 3-jointed exopod and endopod; the 1st basal segment has no spine on the inner margin; the terminal spine of the exopod has 29 teeth.

Remarks: The present specimen is closely related to those of the genus *Undeuchaeta*, but it is difficult to assign this species to any of the members of the genus. The present genus is distinguished from *Undeuchaeta* by the symmetrical genital segment and 3-jointed exopod of the 1st leg. The specimen was obtained off the coast of southern Alaska from a depth between 290 and 340 fathoms.

Scottocalanus infrequens, new species

(Fig. 10, a-h, and 11, a-h)

Occurrence: USNM No. 122571, Albatross Sta. (*ref.* top lines on p. 275), 1 ad. ♀.

Descriptive Notes: Female, 4.76 mm (holotype, USNM No. 122751).

The body is elongate ovate, about 3 times as long as wide. The head is fused with the 1st thoracic segment; the 4th segment is fused with the 5th. The proportional lengths of the cephalothorax and abdomen are as 78 to 22. The head has a triangular median crest. The last thoracic segment is asymmetrical; the right side is acutely pointed, while the left side is narrowly rounded, but is pointed at the distal lateral margin. The rostrum is biramous; it suddenly attenuates in the distal half.

The abdomen is 4-jointed; the segments are in the following proportional lengths:

Segment	1-2	3	4	5	Furca
	44	23	14	8	11=100

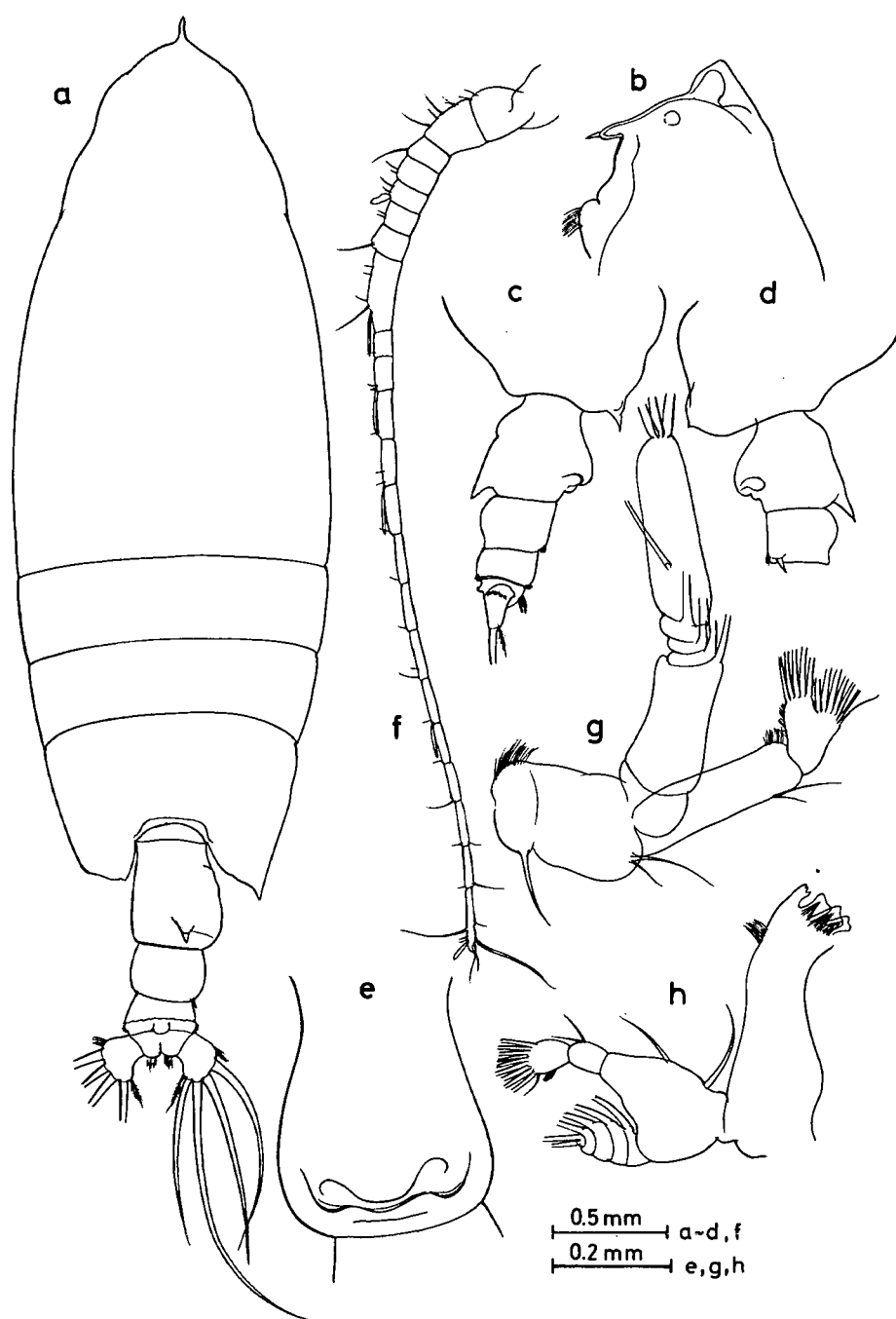


Fig. 10. *Scottocalanus infrequens*, new species, female: a, whole animal, dorsal view; b, head, lateral view; c, last thoracic segment and abdomen, lateral view from right side; d, last thoracic segment and abdomen, lateral view from left side; e, genital segment, ventral view; f, 1st antenna; g, 2nd antenna; h, mandible.

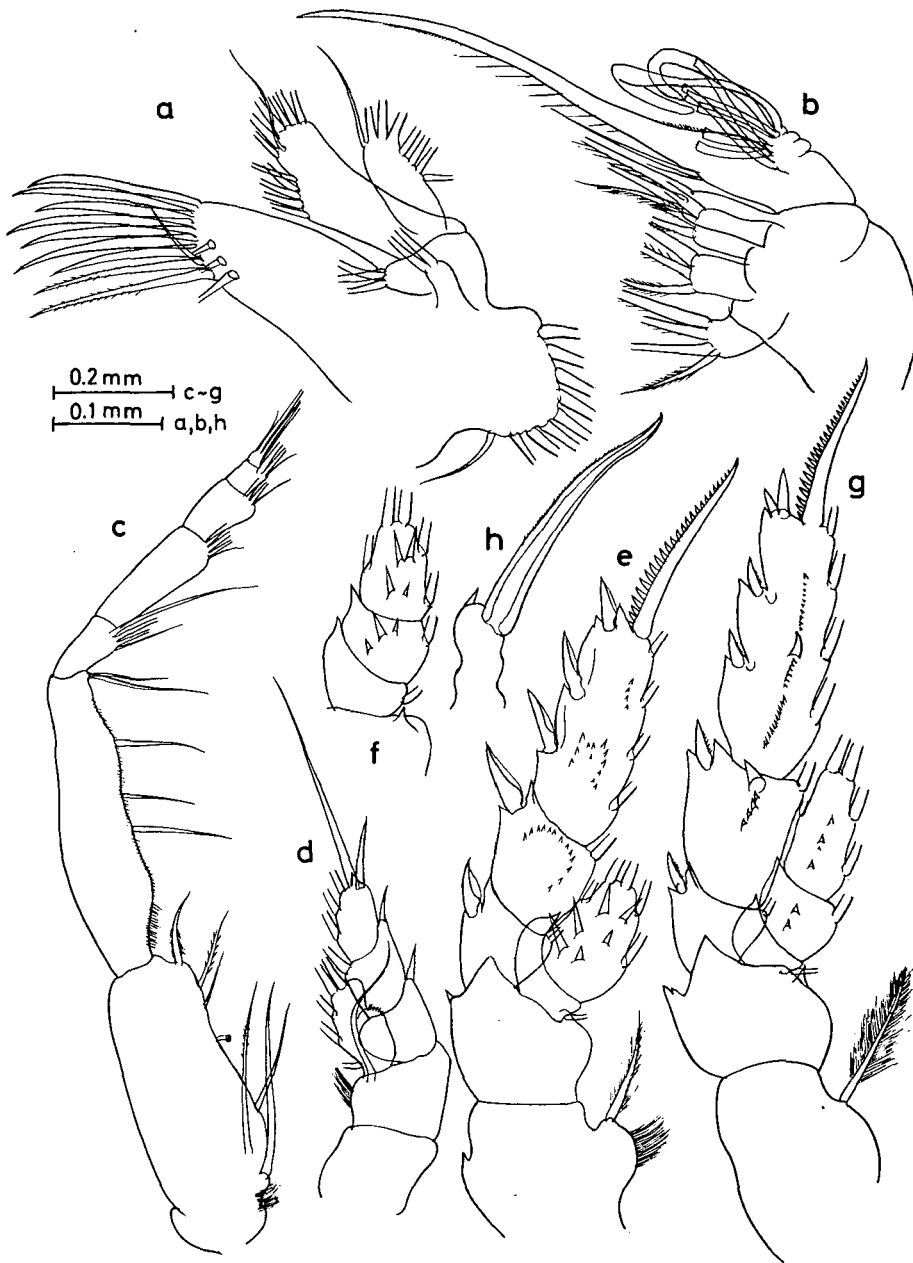


Fig. 11. *Scottocalanus infrequens*, new species, female: a, 1st maxilla; b, 2nd maxilla; c, maxilliped; d, 1st leg; e, 2nd leg; f, 3rd leg, endopod; g, 4th leg; h, left 5th leg.

The genital segment is asymmetrical, swollen on the right lateral margin; a very acute process arises on the dorsal surface near the distal margin; the genital area is considerably produced below. In the 3rd segment the dorsal surface is swollen; the lateral

corner is furnished with a small spine on the left side which is accompanied by a bunch of spinules. The 4th segment is dilated on the distal margin, and is furnished with a row of spinules on the lateral margin. The anal segment is furnished with hairs on the distal margin. The furcal ramus is as long as wide, carrying 4 long marginal setae and a small inner marginal one.

The 1st antenna is 22-jointed, measuring 4.10 mm in length; the 8th, 9th and 10th segments as well as the 24th and 25th are fused; it extends to the level where the cephalothorax articulates to the abdomen. The segments are in the following proportional lengths:

Segment	1	2	3	4	5	6	7	8-9-10	11	12	13	14	15
	73	56	32	27	29	27	29	86	29	37	49	54	49
16	17	18	19	20	21	22	23	24-25					
51	46	49	46	49	44	44	44	51	=1000				

The 2nd antenna has a 6-jointed exopod which is 1.5 times as long as the endopod; the endopod has 5 setae on the outer lobe, and 7 setae on the inner lobe. In the mandible the exopod is as long as the endopod. The exopod is 5-jointed, and carries 6 setae. The endopod is 2-jointed; the 1st segment has 2 setae; the 2nd segment has 10 setae on the distal margin. The mandibular palp is furnished with 2 marginal setae. The cutting blade is mutilated in the present specimen. The 1st maxilla has 9 setae on the outer lobe, 8 on the exopod, 4+3 setae on the endopod, 5 on the 2nd basal segment, 3 setae on the 3rd inner lobe, 2 on the 2nd inner lobe, and 11 setae on the 1st inner lobe. In the 2nd maxilla the endopod is furnished with 8 worm-like filaments; the spine of the 5th lobe is very strong. In the maxilliped the 1st basal segment is robust; the 1st lobe is furnished with, in addition to a long seta, a bunch of hairs; in the 2nd basal segment the inner margin is provided with a row of spinules. The endopod is 5-jointed; the 2nd segment is very long.

The 1st leg has a 3-jointed exopod and a 1-jointed endopod; the 1st segment of the exopod is swollen on the inner margin. The 2nd leg has a 3-jointed exopod and a 2-jointed endopod; the exopod and endopod are furnished with rows of spinules on the posterior surface. The 3rd and 4th legs have 3-jointed exopods and endopods. In the 4th leg the posterior surface of the 2nd and 3rd segments of the exopod are ornamented with a longitudinal row of spinules; on both segments the row contains a large spine. The 5th leg is 1-jointed, and is furnished with a strong spine on the inner distal margin of the basal segment, which is much longer than the segment itself. The right 5th leg was not found in the present specimen.

Remarks: The specimen is easily distinguished from other members of the genus *Scottocalanus* by the asymmetry of the last thoracic segment and by the structure of the genital and 2nd abdominal segments which are furnished with a remarkable spine respectively. The absence of the right 5th leg may be abnormal.

The specimen was obtained at one of the ten Albatross stations in the Pacific Ocean (Stas. 3712, 4757, 4758, 5120, 5185, 5227, 5232, 5233, 5246, and 5263).

Scottocalanus rotundatus TANAKA, 1961

Scottocalanus rotundatus TANAKA, 1961, p. 147, fig. 109.

Occurrence: USNM No. 122535, Albatross Sta. 5231, 1 ad. ♀.

Remarks: The present species is easily distinguished from the other members of the genus by having a rounded forehead in the female.

Author	Locality	Depth	Length mm	
			♀	♂
TANAKA, 1961	Izu region	0-1000 m	4.07	4.38
Present record	Off Philippine	0- 350 fms	—	4.43

Scottocalanus securifrons (T. SCOTT, 1894)

Scottocalanus securifrons, SARS, 1925, p. 160, pl. 45, figs. 1-8; TANAKA, 1961, p. 141, fig. 106; GRICE, 1962, p. 213, pl. 19, figs. 12-15; VERVOORT, 1965, p. 36; OWRE and FOYO, 1967, p. 63, figs. 98, 400-403, 409, 410.

Occurrence: USNM No. 79512, Bache Sta. 10210, 1 ad. ♀, 1 ad. ♂.

Remarks: This very common species is easily recognized by the shape of the genital segment and the 5th pair of legs. Some records of occurrence are listed in the following table.

Author	Locality	Depth	Length mm	
			♀	♂
A. SCOTT, 1909	Malay Archipelago	0-1500 m	4.3	4.75
WITH, 1915	North Atlantic	100- 600 m	4.49	4.98
SARS, 1925	North Atlantic	0-1000 m	4.50	—
FARRAN, 1929	Off New Zealand	Surface	3.88-4.50	—
SEWELL, 1947	Arabian Sea	0- 500 m	—	—
TANAKA, 1961	Izu region	0-1000 m	4.29	4.81
GRICE, 1962	Equatorial Pacific	0- 280 m	4.08	—
Present record	Off Bahamas	—	4.07	3.79

Lophothrix frontalis GIESBRECHT, 1895

(Fig. 12)

Lophothrix frontalis, A. SCOTT, 1909, p. 99, pl. 26, figs. 11-20, pl. 29, figs. 1-10; SARS, 1925, p. 162, pl. 45, figs. 9-21, pl. 46, figs. 1-7; SEWELL, 1929, p. 193, figs. 70-73; 1947, p. 148, figs. 37, 38; TANAKA, 1961, p. 150, fig. 110.

Occurrence: USNM No. 122532, Albatross Sta. 1 juv. ♂.

Remarks: This is a widely distributed species, occurring in all great oceans. The

distribution and variation in size are shown in the following table. The present immature specimen is 4.80 mm in length.

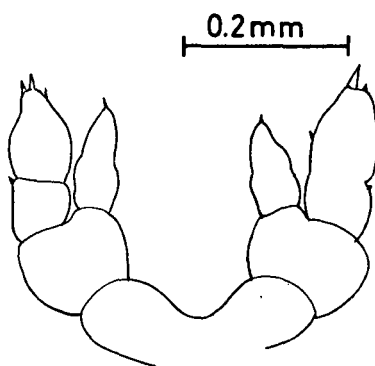


Fig. 12. *Lophothrix frontalis* GIESBRECHT, immature male: 5th pair of legs.

Author	Locality	Depth	Length mm	
			♀	♂
A. SCOTT, 1909	Malay Archipelago	0-1500 m	7.40	5.75
WITH, 1915	North Atlantic	100- 800 m	6.45	5.66
SARS, 1925	North Atlantic	0-1200 m	6.30	4.50
SEWELL, 1929	Bay of Bengal	-	4.88-6.13	4.78
SEWELL, 1947	Arabian Sea	0-1500 m	4.75-6.72	4.50
DAVIS, 1949	Northeastern Pacific	0- 500 m	6.0 -7.4	5.5
TANAKA, 1961	Izu region	0-1000 m	5.80-6.90	5.39
VERVOORT, 1965	Gulf of Guinea	130- 600 m	5.30-6.25	4.52-5.73

Scaphocalanus magnus (T. SCOTT, 1894)

Scaphocalanus magnus, WITH, 1915, p. 189, text-fig. 58, pl. 7, fig. 8, pl. 8, fig. 6; SEWELL, 1947, p. 144, figs. 35, 36; VERVOORT, 1957, p. 111; TANAKA, 1961, p. 158, fig. 113.

Occurrence: USNM No. 122535, Albatross Sta. 5785, 1 ad. ♀.

Remarks: This well-known species has a very wide distribution, occurring in all great oceans.

Author	Locality	Depth	Length mm	
			♀	♂
ESTERLY, 1905	San Diego region	0- 400 fms	4.4	—
A. SCOTT, 1909	Malay Archipelago	-	4.0 -4.5	4.5
WITH, 1915	North Atlantic	-	5.23	4.74
SEWELL, 1929	Bay of Bengal	0- 200 fms	4.90	—
SEWELL, 1947	Arabian Sea	400- 685 m	3.55-4.97	—
DAVIS, 1949	Northeastern Pacific	700-1100 m	3.7 -5.6	4.5 -4.8
TANAKA, 1961	Izu region	0-1000 m	4.39-4.85	4.65
VERVOORT, 1965	Gulf of Guinea	0- 100 m	4.02-4.35	—
Present record	Off Philippine	-	4.43	—

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